11+ ENTRANCE EXAMINATION

SOLIHULL

SAMPLE PAPER

MATHEMATICS

Time allowed: 1 hour 30 minutes

INSTRUCTIONS FOR CANDIDATES

The paper is divided into Sections **A, B** and **C**.

Write your candidate number in the box provided at the beginning of each section.

Answer **all** the questions in Section **A** and as many as you can in Sections **B** and **C**. If you find a question hard, don't worry, leave it and move on to the next question. You can always come back to it later.

When you have finished one section go on to the next section straight away.

NO CALCULATORS MAY BE USED FOR ANY PART OF THIS EXAM

Candidate Number:_____

Section A

INFORMATION FOR CANDIDATES

Write your candidate number in the space provided at the top of this sheet.

There is no need to show any working in Section A, but you may use the space provided to do any calculations that you may wish to make.

In each question you should put your answer in the box provided. The mark for each question is shown in brackets.

1.

$$\begin{array}{rr} & 5859 \\ + & \underline{7394} \end{array}$$

[1 mark]

2.

$$\begin{array}{rr} & 765 \\ - & \underline{389} \end{array}$$

[1 mark]

3.

$$\begin{array}{r} 674 \\ \times \quad 7 \\ \hline \end{array}$$

[1 mark]

4.

$$\begin{array}{r} 2536 \\ \hline 4 \end{array}$$

[1 mark]

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5. How many seconds are there in 8 minutes?

[1 mark]

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6. All these fractions are the same

$\frac{2}{3}$, $\frac{10}{15}$, $\frac{60}{90}$, $\frac{x}{24}$, $\frac{50}{y}$

(i) What is the value of x?

[1 mark]

(ii) What is the value of y?

[1 mark]

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7. Here are some numbers

0.9 0.899, 0.0999, 0.909, 0.09, 0.9009

(i) Which is the smallest?

[1 mark]

(ii) Which is the largest?

[1 mark]

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8. Mark has 400 football stickers. He sticks 70% into his football sticker book, swaps 25% with his friend Peter and gives the rest away.

(i) What percentage does he give away?

[1 mark]

(ii) How many does he stick in his book?

[1 mark]

(iii) How many does he give away?

[1 mark]

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9. There are 329 days until my birthday. How many weeks is this?

[1 mark]

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10. Write the number two hundred and 4 million, thirty five thousand and eighty two in figures.

[1 mark]

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11. What is the next number in each of these sequences?

(i) 3, 9, 15, 21, 27, 33 ……

[1 mark]

(ii) 2, 5, 10, 17, 26 ……

[1 mark]

(iii) 1000, 900, 810, 730, 660 ……..

[1 mark]

12. I think of a number. Multiply it by 6 and subtract 7 to get an answer.

(i) If I start with 12, what is my answer?

[1 mark]

(ii) If my answer is 41, what number did I start with?

[1 mark]

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13. If you buy 8 second class stamps costing 44p each, how much change would you receive from £5.

[1 mark]

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14. A train leaves Solihull at 6.35 am and arrives at Liverpool at 10.22 am.
How many minutes does it take?

[1 mark]

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15. Mia cycles at 12 mph.
How far does she travel in

(i) 4 hours

[1 mark]

(ii) 7½ hours

[1 mark]

(iii) 11 hours 15 minutes

[1 mark]

Candidate Number:_____

Section B

INFORMATION FOR CANDIDATES

Write your candidate number in the space provided at the top of this sheet.

Answer as many of the following questions as you can.

If a question seems difficult, leave it and go on to one of the other questions.

Present your working neatly in the spaces provided.

In each question you should put your answer in the box provided.

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1. A hockey tournament has 32 teams competing, each with 11 players.

(i) How many players are there altogether?

[2 marks]

(ii) Each player brings along 8 supporters to the tournament. How many supporters are there altogether?

[2 marks]

(iii) In total there were 128 matches played. There was an average of 5 goals scored per match. How many goals were scored in total?

[2 marks]

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2. Amy gets in a muddle with her arithmetic.
When it says add she always takes away.
When it says take away she always adds.
When it says multiply she always divides.
When it says divide she always multiplies.

What does she give as the answer to:

(i) 32 - 8

[1 mark]

(ii) 96 x 8

[1 mark]

(iii) She works out a ÷ 8 and gives the answer as 72.
What is the value of a?

[2 marks]

(iv) She works out c ÷ c as 144.
What is the value of c?

[2 marks]

(v) If she works out b x 4 + 4 she gets 4.
What is the value of b?

[2 marks]

3. A test to find whether a number is divisible by 9 is to add up the digits.
If the result is divisible by 9 so is the original number.

For example, in the number 576, the sum of the digits is 5 + 7 + 6 = 18

Since 18 is exactly divisible by 9, the number 576 is also divisible by 9.

On the other hand, in the number 1357, the sum of the digits is 1 + 3 + 5 + 7 = 16

Since 16 is not divisible by 9, the number 1357 is not divisible by 9.

(i) Find whether these numbers are divisible by 9 or not. Write "Yes" or "No" in the answer box.

(a) 279

[1 mark]

(b) 3583

[1 mark]

(c) 22221

[1 mark]

(ii) What is the smallest number that must be added to 636 to make it divisible by 9?

[2 marks]

(iii) What is the smallest number that must be taken away from 2456 to make it divisible by 9?

[2 marks]

(iv) The five digit number b6b51 is divisible by 9. What is the value of the b?

[2 marks]

4. If you go on holiday to Canada and change your Pounds into Canadian Dollars, you receive Dollars at the rate of 5 Dollars for every 3 Pounds.

(i) William changes £240 into Dollars at the beginning of his holiday.
How many Dollars does he receive?

[2 marks]

(ii) He spends 150 Dollars on a coat. How many pounds is this?

[1 mark]

(iii) He spends 55 Dollars on a pair of training shoes. How many pounds is this?

[1 mark]

(iv) How many Dollars does he have left?

[1 mark]

(v) If these Dollars are changed back into pounds, how many pounds does he receive?

[1 mark]

5. In this question the shapes are NOT drawn to scale.

(i) Find the perimeter (the total length around the outside of the shape) of the rectangle below.



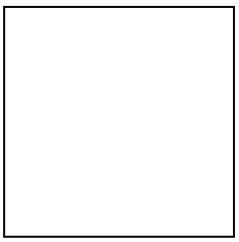
[1 mark]

(ii) Find the area of the rectangle below.



[2 marks]

(ii) A square has a perimeter of 36cm. Find its area.



[2 marks]

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6. James starts a journey at 10.00 am and drives at 60 mph until 1.00 pm.

(i) How far does he travel?

[2 marks]

Because of speed restrictions he then drives at 30 mph until 3.00 pm.

(ii) How far does he go in this stage?

[2 marks]

(iii) What is the total distance he has travelled?

[1 mark]

(iv) What is the total time he has taken?

[1 mark]

(v) What is his average speed for the whole journey?

[2 marks]

7. Here is a sum with some signs missing

2 3 4 = 10

You can make it correct by putting in the correct signs:

2 x 3 + 4 = 10

Fill in the gaps below to make the sums correct.

You may use any of the signs +, -, x, ÷ and you can use brackets if you wish.

(i) 8 4 2 = 34

[2 marks]

(ii) 24 2 8 = 4

[2 marks]

(iii) 32 2 40 4 = 74

[2 marks]

8. The rule **a * b means a x a + b x b**

That is, you multiply the first number by itself, multiply the second number by itself and then add the answers together.

For example, 2 * 3 = 2 x 2 + 3 x 3

= 4 + 9 = 13

And 1 * 2 = 1 x 1 + 2 x 2

= 1 + 4 = 5

(i) Work out 2 * 10

[2 marks]

(ii) Work out 2 * 2 + 3 * 3

[2 marks]

(iii) a * 1 = 65. Work out the value of a.

[2 marks]

Candidate Number:_____

Section C

INFORMATION FOR CANDIDATES

Write your candidate number in the space provided at the top of this sheet.

Answer as many of the following questions as you can.

If a question seems difficult, leave it and go on to one of the other questions.

Present your working neatly in the spaces provided.

In each question you should put your answer in the box provided.

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1. A rule for numbers is to **add 12 and divide the answer by 2.**

For example if you start with 10 you add 12 and get 22 and then you divide by 2 to get 11.

So applying the rule to the number 10 you get the answer 11.

(i) What is the answer if you apply the rule to the number 30?

[2 marks]

(ii) What is the number if you apply the rule <u>twice</u> starting with the number 20?

[2 marks]

(iii) If the rule is applied to a number the answer is 15.
What was the starting number?

[2 marks]

(iv) If the rule is applied twice the answer is 50. What was the starting number?

[2 marks]

(v) The rule is applied once to the number N and the answer you get is also N. What is the number N?

[2 marks]

2. Some numbers read the same forwards and backwards, like **343** and **1221**. We call these numbers ‘mirror numbers’.

(i) Find all 'mirror numbers' between 10 and 100? Write your answers in the space below.

[3 marks]

(ii) Find all the 'mirror numbers' between 100 and 200. Write your answers in the space below.

[3 marks]

3. The three digit number 452 has a digit sum of 11 because 4 + 5 + 2 = 11.

The three digit number 584 has a digit sum of 17 because 5 + 8 + 4 = 17

Write down in the space below all 3 digit numbers that have a digit sum equal to 25.

[3 marks]

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4. There is a number of coins on a table. One quarter of them are showing heads. If I turn over two more coins to show heads then one third of the coins now show heads. How many coins are on the table?

[4 marks]

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5. I want to draw a square in which the perimeter (total length around the outside) is equal in size to the area.

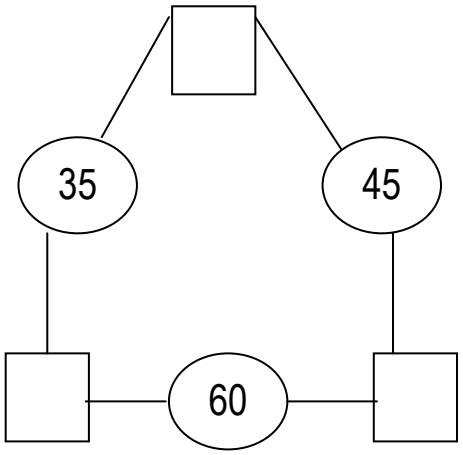
(i) What is the side length of the square?

[3 marks]

(ii) Now I want to draw a rectangle that is twice as long as it is wide. However, its perimeter is still equal in size to its area. What will the length of the rectangle be?

[3 marks]

6. Fill in the missing numbers so that adding each pair of corner numbers gives you the number between them (in the circles).



[3 marks]

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7. In the multiplication 6 x 2 = 3 all the digits are correct, but they are in the wrong places. The sum should be 2 x 3 = 6 (or 3 x 2 = 6).

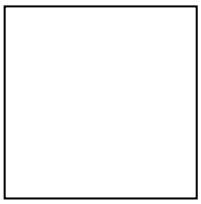
Another example is 3 x 16 = 8. This is wrong. It should be 3 x 6 = 18.

In the multiplications below the digits are also correct but in the wrong places. Write them again in the correct way:

(i) 4 x 8 = 2

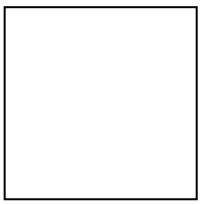
[2 marks]

(ii) 3 x 1 = 42



[2 marks]

(iii) 28 x 1 = 44



[2 marks]

8. Some of the digits are missing in the multiplications below. Find the missing digits and write out the multiplications in the answer box. You may use the same digit more than once.

(i)
```
  6 *
    *   X
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3 * 4
```

[3 marks]

(ii)
```
  * 6 *
      7   X
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* 1 * 3
```

[3 marks]

END OF EXAMINATION